

DANMARKS NATIONALBANK

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Capital requirements for banks – myths and facts



Requirements affect banks' equity and liabilities

New capital requirements mean that a larger share of assets must be funded using equity rather than debt.

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New require- ments increase robustness

The countercyclical capital buffer, the MREL and the completion of Basel III are aimed at increasing the robustness of the banking system.

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More capital lowers required rates of return

The more equity a bank holds, the lower the risk is for both creditors and shareholders.

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Introduction

Since the financial crisis, the banks have been met by stricter requirements for the composition of their equity and liabilities. Especially three new measures have attracted attention: 1. activation of the countercyclical capital buffer; 2. implementation of a new minimum requirement for own funds and eligible liabilities, MREL; and 3. the completion of Basel III, including the introduction of an “output floor”.

The new requirements increase the banks’ ability to absorb losses, thereby contributing to the robustness of the banking system. However, the bank regulation debate has been influenced by several myths about the costs of increasing the banks’ capitalisation. On the face of it, equity may appear to be an “expensive” source of funding, but this is not necessarily the case, given that the risk decreases for both shareholders and creditors when a bank’s equity increases. In addition, previous experience shows that an increase of the capital requirements does not automatically reduce the supply of credit.

The first part of the analysis looks at the significance of equity capital to banks’ funding costs and their ability to meet increased capital requirements. The second part describes the three new requirements and their respective purposes.

The significance of equity capital to the funding costs of banks

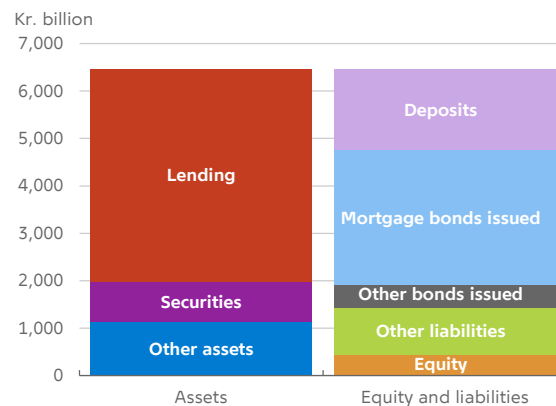
More capital reduces the required rates of return

Capital requirements relate to a bank’s balance sheet, comprising assets on one side and equity and liabilities on the other, cf. Chart 1. The assets side describes the composition of the bank’s assets, consisting of e.g. lending and investments in securities. The equity and liabilities side describes how the bank has funded its assets via debt and equity, respectively.

Equity is the difference between the value of the bank’s assets and the size of its debt. If the value of the assets falls, e.g. due to losses on lending, the bank’s equity shrinks correspondingly, cf. Chart 2. A bank’s shareholders are first in line to absorb losses, while its creditors will not incur losses until the entire equity capital has been lost.

Assets and equity and liabilities of Danish banks, end-2017

Chart 1



Note: Data at group level. Subordinated debt is shown as part of the equity.

Source: Danish Financial Supervisory Authority.

A loss on a bank’s assets will reduce the equity capital correspondingly

Chart 2



Note: Illustrative balance sheet.

Compared with other firms, banks generally have a high ratio of debt funding and little equity capital. The capital requirements have been introduced to ensure that banks hold equity to match the risk on their assets. When capital requirements are increased, a bank must increase its equity ratio and reduce its debt ratio.

The press sometimes gives the impression that an increase of capital requirements by x billion kroner will “cost” the banks an equivalent sum. That is

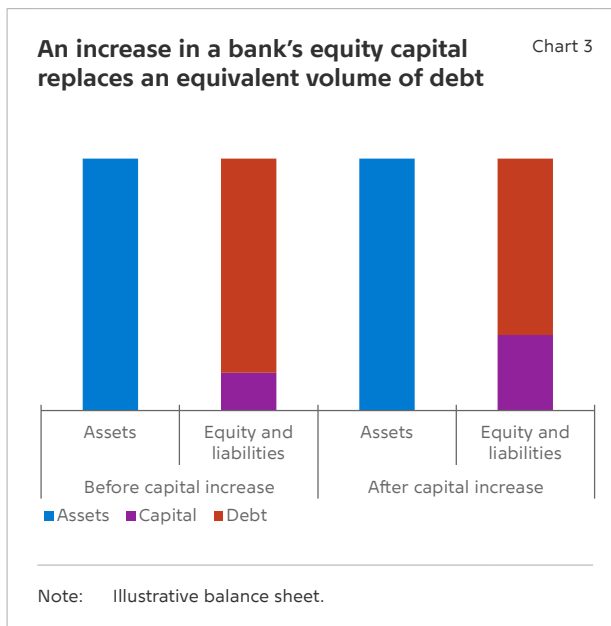
not correct. It does *not* cost one krone to increase equity capital by one krone. Instead, the cost equals a percentage of the additional krone, reflecting the shareholders' expectations of return (the required rate of return).

At the same time, the increase in equity capital replaces an equivalent volume of debt, cf. Chart 3. The bank will no longer have to service the debt that is replaced by equity. Instead, it must remunerate the increased equity capital. Since equity is first in line to absorb losses, the required rate of return on equity is higher than the interest payable on the bank's debt. For this reason, equity capital may appear to be an "expensive" source of funding. But that is not necessarily the case, given that the required rate of return and the rate of interest are both adjusted when the composition of equity and liabilities changes.

As the risk on a bank's assets is independent of the composition of equity and liabilities, it is not affected if some of the bank's debt is replaced by equity. But with a higher equity ratio the bank will be able to absorb correspondingly larger losses on assets before creditors incur losses. Hence, the creditors' risk of losses is reduced.

The equity will still be first to absorb losses and the risk of losing one krone of equity is the same as it was before the capital increase. But there will be more equity to absorb the loss of one krone. Consequently, the relative risk on holding one krone's worth of equity will be smaller than before the capital increase, and the price of the bank's equities will be less sensitive to fluctuations in the value of the bank's assets. So although the shareholders make more equity capital available, the relative risk on (both new and old) equity will be lower than previously.

In other words, the risk for both creditors and shareholders decreases when the equity capital increases. The lower risk is normally reflected in lower interest rates on a bank's debt and a lower required rate of return on its equity capital. This means that the additional costs of changing the composition of equity and liabilities in favour of more equity cannot be calculated as the simple difference between the required rate of return on equity and the rate of interest on the debt. Instead, the difference between the weighted funding costs at various levels of equity should be considered. Otherwise, the additional costs of holding more equity will invariably be



overstated. The calculation of the weighted funding costs is illustrated by an example in Box 1.

It applies not only in theory, but also in practice, that the larger a bank's equity capital is, the lower the rate of interest on its debt and the required rate of return on its equity will be, cf. Chart 4, although both interest and required rate of return are also affected by other factors than the size of the equity.

Adjustment opportunities

Capital requirements are expressed as percentages of a bank's risk-weighted exposures. A bank can adjust to increased capital requirements either by increasing its capital base (the numerator in the capital fraction) or by reducing the risk-weighted exposures (the denominator in the capital fraction). The capital base can be increased either by issuing new equities or by retaining earnings, while risk-weighted exposures can be reduced by selling risky assets or by reducing lending activity.

Retaining part of the bank's earnings as equity does not mean that shareholders are worse off than if all earnings had been distributed as dividend. Distribution of dividend gives shareholders an immediate liquidity benefit, but also reduces the price of the bank's equities. When the bank retains earnings, this liquidity remains in the bank and reduces the need for debt financing. This means that a larger share of the bank's future cash flows will accrue to its shareholders. Basically, the shareholders are just as well

Weighted funding costs – example

Box 1

A bank has a total balance sheet of kr. 1 billion. Equity and liabilities comprise deposits of kr. 700 million, issued bonds of kr. 200 million and kr. 100 million in equity capital. Deposits are remunerated by 0.1 per cent on average, and issued bonds by 0.6 per cent. At the point of departure, shareholders are assumed to require a return of 9.0 per cent. The bank's interest expenses are tax deductible so that the costs of holding debt are reduced by 22 per cent.¹The bank's weighted funding costs can be calculated as follows:

$$(700 * 0.1 \text{ per cent} * (1 - 0.22) + 200 * 0.6 \text{ per cent} * (1 - 0.22) + 100 * 9.0 \text{ per cent}) / 1,000 = 1.05 \text{ per cent.}$$

In 2018, the bank posts a profit of kr. 90 million, of which kr. 40 million is distributed as dividend while the remaining kr. 50 million is used to redeem bonds issued. The total balance sheet thus remains unchanged. The equity and liabilities side now comprises deposits of kr. 700 million, issued bonds of kr. 150 million and kr. 150 million in equity capital.

When the equity is increased, the risk is reduced on both debt and equity capital. Hence, the interest payable on debt and the required rate of return on equity can be assumed to fall. Issued bonds are now remunerated at 0.4 per cent, while the shareholders' required rate of return has been reduced to 7.5

per cent. Given that deposits are to a large extent covered by the deposit guarantee scheme, only a marginal fall in the average deposit rate, to 0.08 per cent, is assumed. The bank's weighted funding costs can now be calculated as follows:

$$(700 * 0.08 \text{ per cent} * (1 - 0.22) + 150 * 0.4 \text{ per cent} * (1 - 0.22) + 150 * 7.5 \text{ per cent}) / 1,000 = 1.22 \text{ per cent.}$$

This example shows that even if the required rate of return on equity differs considerably from the rates of interest on various types of debt, this does not mean that an increase in equity leads to a substantial increase in average funding costs. In the example, the equity capital is increased by 50 per cent, while weighted funding costs rise by only 17 basis points.

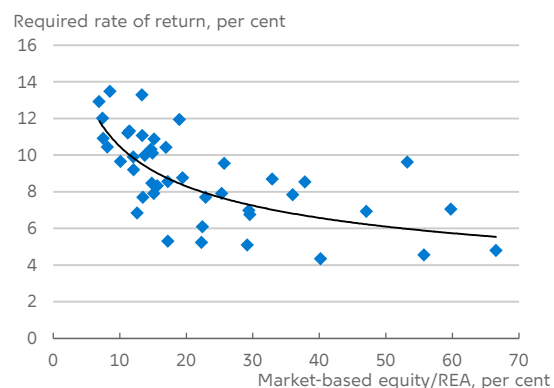
Other assumptions regarding the adjustment of interest rates and required rates of return will naturally produce another result for the impact on weighted funding costs. In practice, the rate of interest on part of the debt will not be adjusted until the debt is renegotiated or refinanced. In the meantime, the bank will not reap the full benefit of its increased capitalisation. So the effect on the weighted funding costs may be greater in the short than in the long term.

¹ Assuming a corporate tax rate of 22 per cent.

Implied required rates of return for large European banks, 3rd quarter 2017

Chart 4

Equity



Senior debt



Note: The required rates of return on equity have been calculated on the basis of a Dividend Discount model and a Capital Asset Pricing model. See Box 3.1 in Danmarks Nationalbank, *Financial Stability*, 1st half, June 2016 for a more detailed description of the method used. The required rates of return for senior debt have been calculated on the basis of CDS spreads. The X axis shows the market value of the equity as a ratio of the risk-weighted exposure amount.

Source: Bloomberg, Thomson Reuters Datastream, Consensus Economics and own calculations.

off as they would have been if the earnings had been distributed as dividend since, all else equal, the value of the bank's equities will be correspondingly higher.

Increased capital requirements do not reduce lending

Danish experience from the transition to Basel III shows that an increase of the capital requirements does not result in a fall in lending. Since end-2009, when the first draft of Basel III was presented, Danish banks and mortgage banks have increased their average Common Equity Tier 1 ratio from 11.3 to 18.2 per cent.¹ The largest part of this increase is attributable to a higher level of equity capital, cf. Chart 5, most of which has come from retained earnings. But total assets have not been reduced, and lending has risen by an average of 1.6 per cent a year. In recent years, lower average risk weights have also contributed to improving the capital ratio, especially among the largest banks, which use internal model approaches for calculation of risk-weighted exposures.

New requirements for the composition of banks' equity and liabilities

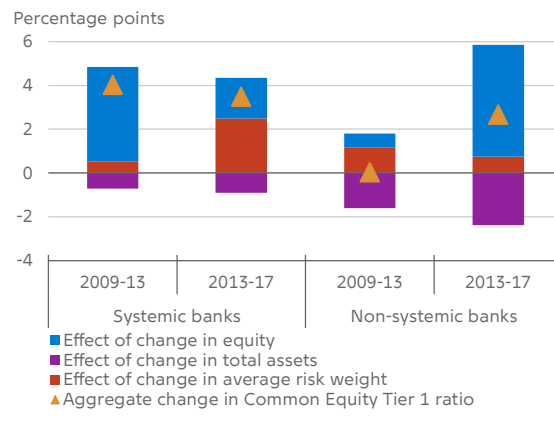
In recent years, three new requirements regarding the composition of the banks' equity and liabilities have attracted attention: 1. activation of the countercyclical capital buffer; 2. implementation of a new minimum requirement for own funds and eligible liabilities, MREL; and 3. the completion of Basel III, including the introduction of an "output floor". Below is a description of each of the new requirements. They are also summarised in Table 1.

The countercyclical capital buffer

In March 2018, the Minister for Industry, Business and Financial Affairs decided to set the countercyclical capital buffer at 0.5 per cent with effect from 31

Transition to Basel III has increased the level of equity capital

Chart 5



Note: Decomposition of the changes in the banks' average Common Equity Tier 1 ratios in the periods 2009-13 and 2013-17. Negative contributions from total assets reflect increases in total assets, including lending.
Source: Danish Financial Supervisory Authority and own calculations.

March 2019. This decision complies with a recommendation from the Systemic Risk Council, which, in December 2017, assessed that risks were building up in the financial system.²

The countercyclical capital buffer is part of the original Basel III reform and has been activated in several countries, including Sweden, Norway, the Czech Republic, Slovakia, Iceland and the UK.

The capital buffer differs from other capital requirements in that it varies with the development in systemic risks. The buffer is to be used to counter a negative impact on the real economy when the financial system is stressed. In that situation the buffer must be released. This makes it easier for the banks to maintain an adequate level of lending in periods of stress in the financial system. But it is a prerequisite that the buffer has been built up *before* the systemic risks materialise.

¹ With Basel III, the minimum requirement for Common Equity Tier 1 capital was increased from 2 to 4.5 per cent. Add to this the introduction of the combined capital buffer requirement, which must also be met using Common Equity Tier 1 capital. Basel III is being implemented in the EU via the Capital Requirements Regulation, CRR, in the period 2014-19.

² In June 2018, the Systemic Risk Council has recommended that the buffer rate is currently kept unchanged at 0.5 per cent. As economic and financial risks are building up faster than anticipated, the Council expects to issue a recommendation during 2018 to raise the buffer rate by a minimum of 0.5 percentage point.

The countercyclical capital buffer is part of the combined buffer requirement, which also includes the capital conservation buffer and – for systemic banks – an individual SIFI buffer. Since the aim is that these buffers will serve as “cushions” if a bank experiences financial problems, inability to meet the combined capital buffer requirement will have no immediate implications for the bank’s operating licence. But the bank’s opportunity to distribute dividends and bonuses will be limited for a period until the combined buffer requirement is, once again, met.

Activation of the countercyclical buffer in Denmark means that the Common Equity Tier 1 requirement is increased by an amount corresponding to 0.5 per cent of the banks’ domestic risk-weighted exposures with credit risk.³ The Systemic Risk Council’s calculations show that a countercyclical buffer rate of 0.5 per cent will increase the total capital requirement for Danish banks by approximately kr. 7 billion.

With the current level of Common Equity Tier 1 capital, the vast majority of Danish banks already meet the countercyclical buffer requirement. For the vast majority, this will also be the case if the buffer rate is increased to more than 0.5 per cent. So activation of the buffer does not lead to an immediate need for injection of more capital, but contributes to ensuring that the banks maintain an appropriate level of excess capital relative to the minimum capital requirement. In other words, the need for adjustment is primarily a question of how much excess capital each bank wishes to have relative to the buffer requirement – and how little excess capital the bank’s creditors and counterparties will accept.

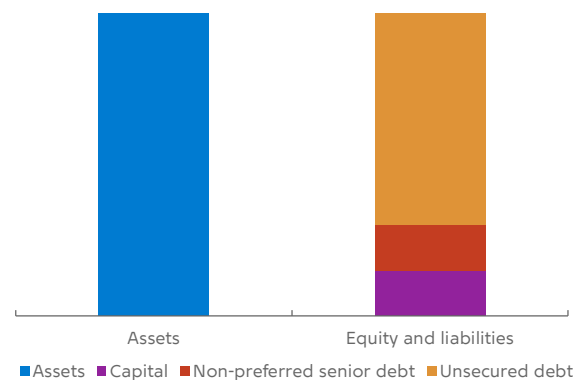
Own funds and eligible liabilities

If a bank incurs losses of such a size that the Danish Financial Supervisory Authority assesses the bank to be failing or likely to fail, it will, as a main rule, be transferred for resolution by the Financial Stability Company if all other possibilities for recovery of the bank have been depleted.

The general resolution principle for systemic banks in Denmark entails that it should be possible to restruc-

A new creditor class as of 1 July 2018

Chart 6



Note: Illustrative balance sheet.

ture the banks and return them to the market with sufficient capital to ensure market confidence. As a main rule, such restructuring must take place without the use of government funds. Instead, capital should be re-established by writing down or converting liabilities. Consequently, a key element of the resolution strategy for these banks is to set minimum requirements for own funds and eligible liabilities, MREL.

The MREL is not a capital requirement, but like capital requirements it entails a restriction on the composition of the banks’ equity and liabilities. The MREL can be met using capital instruments⁴ or debt obligations that are written down or converted before unsecured claims in connection with resolution and winding-up. In March 2018, the Danish Financial Supervisory Authority announced the MREL for three systemic banks, cf. Box 2.

As of 1 July 2018, a new creditor class is also introduced, namely non-preferred senior, NPS, debt, cf. Chart 6. In the case of a resolution, NPS debt will bear losses before unsecured creditors, including depositors, but this does not guarantee that unsecured creditors will not suffer losses in a resolution.⁵

³ Due to the rules on reciprocity, the countercyclical capital buffer also applies to foreign banks’ exposures in Denmark.

⁴ Common Equity Tier 1 capital (equity), Additional Tier 1 capital and Tier 2 capital.

⁵ Deposits of up to approximately kr. 745,000 are still fully covered by the Guarantee Fund.

In the systemic banks, issuance of new NPS debt will to a large extent replace previous issuance of ordinary (unsecured) senior debt. The rate of interest on the new issues will presumably be higher than for corresponding ordinary senior debt, as they are riskier. But the special terms and conditions for the new issues also mean that credit risk on the bank's other debt is reduced. So potentially the bank may obtain lower interest rates on other debt. However, the issues will not have any impact on the risk on the bank's equity, which will still be first in line to absorb losses.

In Denmark, an MREL will be imposed on non-systemic banks, comprising the aggregate capital requirement (i.e. the capital need plus the combined capital buffer requirement) and an MREL add-on of 3.5-11 per cent of risk-weighted exposures. Since small banks do not have the same access to issue debt in the capital markets as large banks have, it can be expected that many of the small banks will meet the MREL add-on using equity capital.⁶

Mortgage banks are not comprised by the MREL. Instead, they must meet a "debt buffer" requirement. For systemic mortgage banks, the debt buffer is to be set at a level which ensures that the aggregate debt buffer and capital base requirement is at least 8 per cent of total equity and liabilities.⁷ However, the debt buffer must always constitute at least 2 per cent of the mortgage bank's lending.

Completion of Basel III and introduction of an output floor

In December 2017, the Basel Committee presented a reform package known as the completion of Basel III. The reform package supplements the measures that were part of the original Basel III reform from

6 Danmarks Nationalbank has previously argued in favour of resolving small and medium-sized banks according to simplified principles, so that it would not be necessary for these banks to meet an MREL, cf. Danmarks Nationalbank's consultation response to the Danish Financial Supervisory Authority of 27 February 2017 ([link](#)).

7 Likewise, it applies to mortgage banks that are part of a systemically important group that the debt buffer must be set at a level which ensures that the aggregate requirement for the group's debt buffer, capital base and own funds and eligible liabilities constitutes at least 8 per cent of the group's total equity and liabilities. Danmarks Nationalbank would have preferred a risk-sensitive approach to setting the requirement and still recommends that the Danish MREL exemption for mortgage banks be abolished, cf. Danmarks Nationalbank's consultation response to the Danish Financial Supervisory Authority of 19 February 2018 ([link](#)).

Status of announcement of MRELS for Danish banks

Box 2

In March 2018, the Danish Financial Supervisory Authority announced the MREL for three systemic banks: Danske Bank, Jyske Bank and Sydbank. For these banks, the MREL has been set at twice the total capital requirement (i.e. two times the capital need plus two times the combined capital buffer requirement). This means that these banks may lose an amount corresponding to the total capital requirement and then be recapitalised so that they will, once again, meet the capital requirements when returned to the market. According to the Danish Financial Supervisory Authority, the resolution plans for Nykredit and DLR Kredit will follow after 1 July 2018, when an amendment to the Financial Business Act takes effect.

The MRELS for Danske Bank, Jyske Bank and Sydbank total kr. 285 billion¹, half of which overlaps with the banks' existing capital requirements. The MREL must be met by 1 July 2019. A transitional arrangement means that part of the banks' existing debt issued that does not meet the requirement that they have to bear losses before unsecured claims may be included in the funds to meet the MREL until 1 January 2022. However, the banks are not expected to have difficulty in meeting the requirement.

In May 2018, Danske Bank issued its first Non-Preferred Senior Notes in accordance with the MREL criteria. The first issuance took place at a price corresponding to a margin of 53 basis points above the Euribor swap rate. According to Danske Bank the interest rate premium to reflect that these notes will be written down before unsecured claims in the case of resolution is approximately 25 basis points.²

Based on the Danish Financial Supervisory Authority's principles for setting MRELS for smaller banks, the aggregate MREL add-on for small and medium-sized banks can be estimated to lie within the range kr. 11-18 billion. This amount is to be covered by own funds and eligible liabilities in addition to existing capital requirements of approximately kr. 33 billion. The MREL add-on for non-systemic banks is expected to be fully phased-in by 1 January 2023.

1. The MREL is set as a percentage of the banks' total commitments and capital base. The amount stated has been calculated on the basis of the banks' reporting at end-2016.

2. Cf. article on [Finanswatch](#) 17 May 2018.

2010. While the 2010 reform focused on strengthening the banks' capitalisation and liquidity reserves by introducing a number of new buffers and regulatory key ratios, the completion of Basel III has focused primarily on revising the principles for calculation of the banks' risk weights.

Several international analyses have shown considerable variation in the size of the risk weights across banks. With the new reform package, the Basel Committee wishes to increase the credibility of risk-based capital regulation and to improve the comparability of banks' capital ratios. Among other things, the reform includes a revision of the existing standardised approaches for credit risk and operational risk, new restrictions on the banks' use of IRB approaches and introduction of an "output floor" for total risk-weighted exposures.

Especially the output floor has attracted considerable attention in Denmark. The output floor limits the capital advantage that a bank can gain from using IRB approaches. More specifically, this means that a bank's total risk-weighted exposures calculated using IRB approaches cannot constitute less than 72.5 per cent of the risk-weighted exposures calculated using the standardised approaches. In other words, the bank's "discount" when using IRB approaches may not exceed 27.5 per cent.

Calculations made by a group of experts appointed by the Minister for Industry, Business and Financial Affairs in February 2017 show that, overall, the completion of Basel III will cause the capital requirement for the largest Danish banks and mortgage banks to rise by around kr. 78 billion.⁸ Measured relative to risk-weighted exposures, this corresponds to an average increase of 5.5 percentage points in the banks' capital requirements. The output floor is by far the most significant reason for this increase.

The Basel Committee envisages that the reform package will enter into force on 1 January 2022, with phasing-in of the output floor in the period from 2022 to 2027. The package must be adopted by the EU before the new rules will apply to Danish banks.

⁸ The calculations are based on data for Danske Bank, Nykredit Realkredit, Jyske Bank, Nordea Kredit and Sydbank as at 30 September 2016. It has been assumed that the institutions' Pillar 2 requirements are unchanged in nominal terms. See Ministry of Business, Industry and Financial Affairs, Effekter af Baselkomiteens anbefalinger om kapitalkrav til kreditinstitutter (Effects of the Basel Committee's recommendations on capital requirements for credit institutions – in Danish only), February 2018.

Overview of new requirements for the composition of banks' equity and liabilities

Table 1

	Countercyclical capital buffer	MREL	Basel reform excl. output floor	Output floor
Status	Set at 0.5 per cent	To be announced in 2018	Not adopted	Not adopted
Commencement	31 March 2019	Expected to be fully phased-in by 2022	1 January 2022 (expected)	Gradual phasing-in 2022-27 (expected)
Institutions comprised	Banks and mortgage banks	Banks ¹	Banks and mortgage banks	Banks and mortgage banks applying internal models
Affects minimum capital requirement	No	No	Yes	Yes
Affects buffer requirement	Yes	No	Yes	Yes
Increase in risk-weighted exposures, per cent	-	-	11.3 ³	22.5
Increase in capital requirement, kr. billion	7	-	26 ³	52
Required own funds and eligible liabilities (in addition to capital requirement), kr. billion		154-160 ²		
Eligible instruments	Common Equity Tier 1 capital	Common Equity Tier 1 capital/ Additional Tier 1 capital/ Tier 2 capital/ Debt that is written down or converted before unsecured claims in connection with resolution and winding-up	Common Equity Tier 1 capital A small share can be met using Additional Tier 1 capital and Tier 2 capital	Common Equity Tier 1 capital A small share can be met using Additional Tier 1 capital and Tier 2 capital

¹ Mortgage banks must instead meet a debt buffer requirement.

² This amount comprises the requirements announced so far for Danske Bank, Jyske Bank and Sydbank (less existing capital requirements) plus the estimated MREL add-on for small and medium-sized banks.

³ Estimate for the five largest Danish banks and mortgage banks. Small and medium-sized banks are also expected to be comprised by the new standardised approaches.

ABOUT ANALYSIS



As a consequence of Danmarks Nationalbank's role in society we conduct analyses of economic and financial conditions.

Analyses are published continuously and include e.g. assessments of the current cyclical position and the financial stability.

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